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# PHYSICAL FITNESS FOR LAWN BOWLING

*by* **Rob Judson**  
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## General Fitness and Health

Lawn bowls imposes lower physical demands than many other sports impose on players. The general physiological requirements of lawn bowls are good general health and a well-functioning cardio-vascular system. Playing of several competitive games on each of several consecutive days would clearly make greater physical demands on bowlers than one social game per day.

Elements of physical fitness of most benefit are endurance and limb flexibility. Any training undertaken does not necessitate high intensity work. Partly because of their average age, few bowlers undertake fitness training. Those bowlers who do undertake fitness training, need to be aware of the recommended maximum heart rate for their age. It is  $208 - 0.7 \times \text{age}$  (in years). So a 60-year-old bowler should avoid activities that could cause heart rate to rise above  $208 - 42 = 166$  beats per minute. In general, bowlers of or above middle age should aim for a heart rate about  $2/3$  of the maximum for their age during training.

Because the sport does not require a high degree of physical conditioning, some bowlers mistakenly believe either that physical fitness does not provide a competitive advantage, or that unfitness is not a disadvantage. In games between bowlers of similar competence but differing fitness levels, the fitter bowler tends to have a competitive edge.

Adverse lifestyle habits that affect physical capacity for competitive bowling include:

- smoking,
- alcohol,
- obesity,
- insufficient sleep, and
- non-prescribed pharmaceuticals.

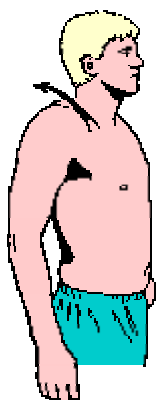
Bowlers should appreciate the effects of these, even though they might be reluctant to avoid adverse indulgences. Excess body weight is a condition that commonly affects performance, fitness and health. The Body Mass Index (BMI) of an individual takes into account height and body weight. The BMI is the weight expressed in kilograms divided by the height (in metres) squared. In short,  $\text{BMI} = W \div H^2$ . The appended table shows BMIs according to the column that corresponds with height, and the row that corresponds with body weight. (Weights expressed in pounds need to be divided by 2.2 to convert them to kilograms).

The ideal range for BMI is between 20 and 25. Bowlers with BMIs between 25 and 30 are generally overweight. Bowlers with BMIs exceeding 30 are generally obese and should consider losing weight. Bowlers with BMIs between 18 and 20 are generally underweight. Bowlers with BMIs under 18 should consider gaining enough weight to enter the ideal range.

## Warm Up & Stretching

### Warm Up

Trial ends, though useful, are inadequate as a warm up for bowlers. As a result, bowlers tend to be less effective until they have warmed up and acquired full joint flexibility. Warm up is the process of physiologically preparing for bowling. Warming up for bowls requires brief gentle exercise (e.g. walking) to stimulate the circulation rate and warm joints and muscles. The muscular-skeletal system thereby functions more efficiently and has less likelihood of sustaining injury.

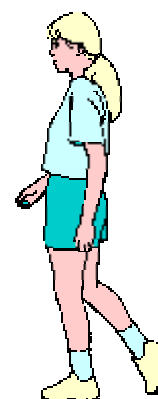


Warming up dissipates any stiffness. It prepares a bowler's body for controlled and accurate movements from the outset. It also tends to induce a relaxed and ready state of mind.

### Stretching

A slow start is not a good way to begin a competition. Pre-game static stretching is the solution to this problem. Stretching exercises should be effective, quick, simple, and reasonably unobtrusive

It takes only a couple of minutes to stretch all muscles important for bowling. Static stretching involves flexing or extending each major muscle group in turn and holding it at the limit of its normal range of movement for about six seconds before allowing it to relax. Stretching should avoid discomfort and any ballistic movements. Bowlers should breathe deeply while stretching.

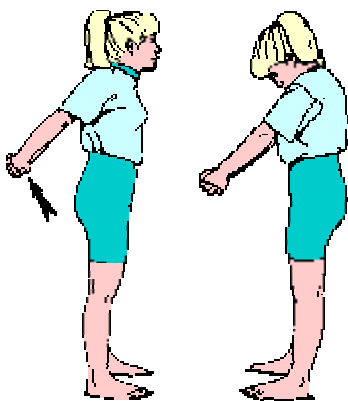


The Australian bowls coaches' manual details a range of stretches for the major muscles of the legs, back, arms and neck. The stretching process for bowls should include gentle working of major muscle groups. A good choice of stretches would not require any equipment, nor result in soiling of bowling attire.

Even just before a competition, bowlers should find enough time to:

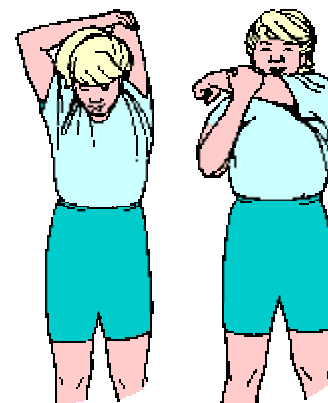
- circle the extended delivery arm forwards & backwards 8-10 times each way
- while standing, hug each knee towards the chest
- flex and loosen knees and ankles.

Before a practice session, bowlers should have ample time for stretching.

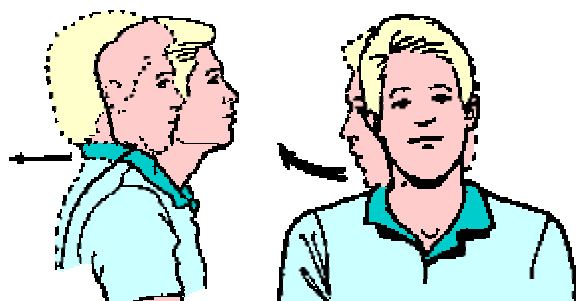


Two stretches for the arms follow. On the left, the bowler extends the arms behind the back and clasps hands. Raising of the arms stretches the muscles in the chest and upper arms. A similar stretch involves extending the arms forward with wrists crossed and palms clasped together. The bowler raises the arms to an overhead position and then returns them to the start position. On the right, the bowler has arms in the forward position. However, the exercise there comprises using the non-bowling hand as a resistance for flexing and extending the fingers and wrist of the bowling hand.

the back, and pulls on the elbow with the non-bowling hand. A bowler can enhance the value of the stretch by bending the trunk towards the non-bowling side. On the right, the bowler demonstrates a triceps stretch. The triceps and pectoral muscles provide much of the power for the forward swing of a bowl. A bowler rests the hand of the bowling arm on the opposite shoulder and pulls on the elbow with the non-bowling hand.

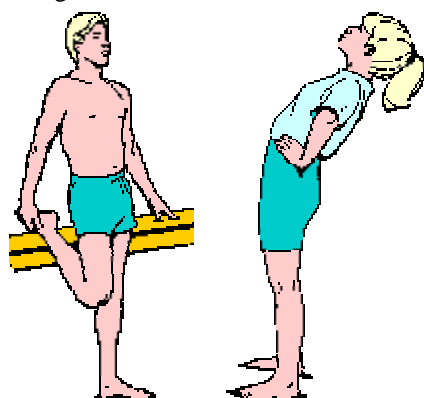


Two stretches for the upper arms and shoulders follow. On the left, the bowler demonstrates a latissimus dorsi stretch. This muscle provides much of the power for the back swing of a bowl. A bowler places the bowling hand (in this case, the left hand) behind the neck or extending down

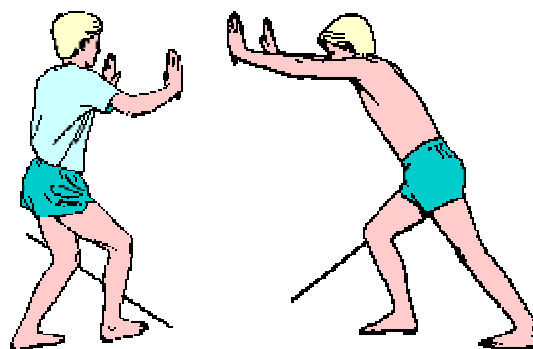


Stretches for the neck follow. On the left, the bowler demonstrates neck flexion and extension forward and back (nodding movement). On the right, the bowler demonstrates stretching by turning the head left and right (shaking movement). Not illustrated is tilting the head towards each shoulder (rocking movement). Neck exercises demand care. Exercise in more than one plane at a time (e.g. head rotation) should be avoided

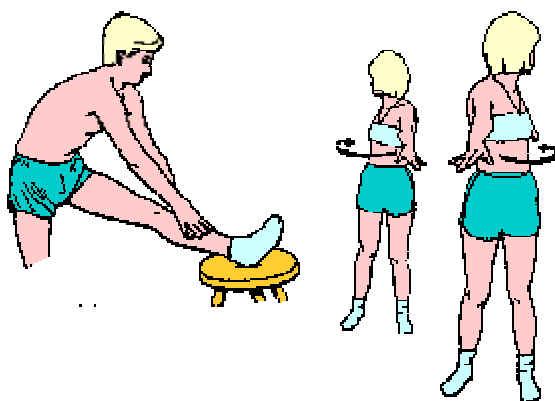
Standing stretches for the calf or lower leg follow. Using the usual method, bowlers position a pace away from a wall. They lean forward, placing outstretched arms against the wall and have both heels on the floor. In both cases, the back leg is the one being stretched. On the left, the bowler demonstrates the Achilles



and soleus stretch. The soleus is the large flat muscle just above the Achilles tendon. Note that both knees are slightly flexed. On the right, the bowler demonstrates the gastrocnemius stretch. The gastrocnemius is the thick calf muscle just below the knee. Note that the back leg is straight.



On the left, the bowler demonstrates a standing quadriceps stretch. The quadriceps is the large thigh muscle. The leg under stretch is the bent one. The corresponding foot is pulled up toward the buttock. On the right, the bowler executes a simple form of back arch to stretch back muscles.



On the left, the bowler demonstrates a hamstring stretch. To stretch a hamstring, a bowler supports the corresponding foot on an elevated surface. With outstretched arms for support, the bowler leans forward to stretch the hamstring. An alternative method involves placing the corresponding foot on a lower surface and flexing the knee. The bowler leans forward in a posture similar to that for delivering a bowl, taking the chest towards the knee, to stretch the hamstring. The bowler on the right is executing spinal twists. These movements are primarily a warming up exercise, but do produce some stretching of back and hip muscles.

## Talent Identification (TID)

### Identification versus 'Scouting'

At least until 1987, methods of talent identification (TID) in Australia were generally very rudimentary. Talent scouts with a 'good eye' observed trial games or competitions, to discover talented players. In lawn bowls and many other sports this process is still about the only method of 'talent identification' used. 'Talent scouting' is a term that might better describe this practice. Lawn bowling is not a skill that children can experience by improvisation in the schoolyard or playground. Today's talented bowlers represent those who have become successful in lawn bowling more typically by chance than through specific guidance.

### Focus of TID

More systematic methods of TID have emerged since 1987. The Australian Institute of Sport (AIS) introduced TID in sports such as rowing, cycling, track and field, and canoeing. Sport scientists determine the physical and physiological demands of particular sports and make recommendations about the type of athletes suited to them. The Australian Sports Commission (ASC) introduced 'Sports Search', a program involving labour intensive anthropometric measuring and fitness testing of willing 12 to 16 year old subjects at participating schools. TID focuses on attributes that cannot readily change through training. For example, heredity is the primary influence on height and body shape. Training has little influence on such characteristics. A coach once said: "Training cannot put in what God left out".

Newer TID programs do not focus on players already skilled in sports being targeted. They focus on youthful athletes who have the physical attributes but perhaps no experience whatever in particular sports. Usage of the term 'Talent Identification' increasingly means these newer and more scientific programs.

### TID for Lawn Bowls

Lawn bowls is not a sport warranting a rigorous TID program. Lawn bowling imposes only modest physical demands on players. However, even limited demands can sometimes challenge the quality of performances.

The participation pyramid in lawn bowls has a broad base. Elite level bowling is a rather small apex of that pyramid. In addition, overall participation has been in decline for many years. Member recruitment programs appropriately focus more on numbers than on potential of new players. However, authorities could introduce TID procedure wherever an influx of youthful newcomers occurs, to identify those most likely to respond to specialised coaching and training.

### Tests and Measurements

The prescribed textbook for Level 2 Coaching Principles' Courses in Australia, describes measurement methods. The syllabus of this course includes brief training in somatotyping and anthropometric measuring. Thus, Level 2 lawn bowls coaches should have had exposure to the methods involved. Coaches who work with school groups may have had the opportunity to apply simple TID programs. However, such work in lawn bowls would have little point in the absence of funding for developmental programs.

Individuals within school groups would display wide variation in motivation and talent for lawn bowling. A primary aim of a TID program would be to identify the individuals with suitable attributes (i.e. 'talent') for the sport. The aim should encourage them to receive specialised coaching and training additional to the school group program. TID programs simplified for lawn bowls would exclude testing of factors more relevant to aerobic sports. This would probably include tests of power, speed, agility, oxygen uptake, etc. Talent factors relevant to bowls would probably include most of those identified in the second of the two following tables.

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## Body Mass Index (BMI) Table

	Height										
(Metres)	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00
(Inches)	59	61	63	65	67	69	71	73	75	77	79
Wt (kg)	Body Mass Index (BMI)										
40	18	17	16	15	14	13	12	12	11	11	10
42	19	17	16	15	15	14	13	12	12	11	11
44	20	18	17	16	15	14	14	13	12	12	11
46	20	19	18	17	16	15	14	13	13	12	12
48	21	20	19	18	17	16	15	14	13	13	12
50	22	21	20	18	17	16	15	15	14	13	13
52	23	22	20	19	18	17	16	15	14	14	13
54	24	22	21	20	19	18	17	16	15	14	14
56	25	23	22	21	19	18	17	16	16	15	14
58	26	24	23	21	20	19	18	17	16	15	15
60	27	25	23	22	21	20	19	18	17	16	15
62	28	26	24	23	21	20	19	18	17	16	16
64	28	27	25	24	22	21	20	19	18	17	16
66	29	27	26	24	23	22	20	19	18	17	17
68	30	28	27	25	24	22	21	20	19	18	17
70	31	29	27	26	24	23	22	20	19	18	18
72	32	30	28	26	25	24	22	21	20	19	18
74	33	31	29	27	26	24	23	22	20	19	19
76	34	32	30	28	26	25	23	22	21	20	19
78	35	32	30	29	27	25	24	23	22	21	20
80	36	33	31	29	28	26	25	23	22	21	20
82	36	34	32	30	28	27	25	24	23	22	21
84	37	35	33	31	29	27	26	25	23	22	21
86	38	36	34	32	30	28	27	25	24	23	22
88	39	37	34	32	30	29	27	26	24	23	22
90	40	37	35	33	31	29	28	26	25	24	23
92	41	38	36	34	32	30	28	27	25	24	23
94	42	39	37	35	33	31	29	27	26	25	24
96	43	40	38	35	33	31	30	28	27	25	24
98	44	41	38	36	34	32	30	29	27	26	25
100	44	42	39	37	35	33	31	29	28	26	25
102	45	42	40	37	35	33	31	30	28	27	26
104	46	43	41	38	36	34	32	30	29	27	26
106	47	44	41	39	37	35	33	31	29	28	27
108	48	45	42	40	37	35	33	32	30	28	27
110	49	46	43	40	38	36	34	32	30	29	28
112	50	47	44	41	39	37	35	33	31	29	28
114	51	47	45	42	39	37	35	33	32	30	29
116	52	48	45	43	40	38	36	34	32	31	29
118	52	49	46	43	41	39	36	34	33	31	30
120	53	50	47	44	42	39	37	35	33	32	30

<b>BMI Range</b>	<b>Weight Range</b>
Under 18	Very underweight
18-20	Underweight
20-25	Normal
25-30	Overweight
Over 30	Obese

## Talent Identification for Lawn Bowls

Suggested Tests and Measurements, with the underlying rationale.

Test/Measurement	General Considerations	Bowling Considerations
Age (If child)	Relates to height, weight	Capacity for bowling influenced by stage of growth and physical development
Height	Height of older siblings, parents	Is delivery at the green surface easier for short bowlers, who do not have to bend as far as tall bowlers? Do bowlers well under average height greatly outnumber bowlers well above average height? Do tall people prefer basketball, netball, football, etc where their height is an advantage? Do many tall people take up lawn bowling and progress to elite performer levels? Are shorter bowls champions much more common, over the years? Should heights of a statistical sample of elite bowlers be benchmarked?
Weight	Over/underweight Body Mass Index (BMI) = Weight (kg) ÷ Height <sup>2</sup> (m) Somatotype of parents: 'Mesomorph'=muscular, well-developed chest, shoulders, upper arms 'Endomorph'=overweight, well-developed hips, thighs 'Ectomorph'=thin and tallish	Is a newcomer with obese parents or older siblings likely to develop differently? Is obesity a disadvantage to performance? Above what BMI value (norm 20-25) does excess weight influence bowling performance? Should BMIs of elite bowlers be benchmarked? What somatotype mix suits bowling ability? Would, say, 38% mesomorphism, 34% endomorphism, and 28% ectomorphism be close to ideal? Should somatotypes of a sample of elite bowlers be charted?
Skin fold Measurement (Skin fold callipers)	Body fat. Correlate with BMI. Check diet	Does over or underweight significantly affect performance? What performance factors are most affected: endurance, fitness, flexibility, etc? Do family characteristics in each case indicate that bodyweight factors are congenital or are controllable through programs?
Grip Strength (Calibrated dynamometer)	Firm grip	Strength to hold a bowl of appropriate size with the fingertips on fast greens and to grasp a bowl firmly for quicker deliveries or on slower greens.
Sit Ups (Number/min - feet held)	Abdominal & hip strength Endurance, Resistance to muscular fatigue.	Resistance to fatigue of lower trunk during long games in tournaments.
Push Ups (Number/min)	Arm & shoulder girdle strength Fine movement control Resistance to muscular fatigue	Strength to deliver fast bowls on very slow greens or in attacking play.
Sit and Reach (cms)	Trunk flexion Hamstring soundness Lower back strength Freedom from lower back pain.	Resistance to fatigue of hip and large leg muscles during long games in tournaments.
Hip Range of Motion (Goniometric measurement - degrees)	Hip flexibility	Consistent and comfortable movement into and recovery from a stable delivery stance